

**HATCHERY REFORM IN PUGET SOUND AND COASTAL WASHINGTON:  
MANAGING HATCHERY PROGRAMS TO HELP RECOVER WILD SALMON  
AND SUPPORT SUSTAINABLE FISHERIES**

**A Joint Report to Congress on the Hatchery Reform Project  
Prepared by Long Live the Kings and the Hatchery Scientific Review Group**

**June 29, 2000**

**Hatchery Scientific Review Group  
Long Live the Kings  
1305 Fourth Avenue, Suite 810, Seattle, WA 98101  
(206) 382-9555, [lltk@lltk.org](mailto:lltk@lltk.org)  
[www.lltk.org/hatcheryreform.html](http://www.lltk.org/hatcheryreform.html)**



## **TABLE OF CONTENTS**

- I. Executive Summary**
- II. Introduction**
- III. The History of Hatcheries: Management for Production**
- IV. The Future of Hatcheries: Management for Recovering Wild Stocks and Supporting Sustainable Fisheries**
- V. The Hatchery Reform Project**
- VI. The Hatchery Scientific Review Group**
- VII. The Hatchery Reform Coordinating Committee**
- VIII. FY 2000 Expenditures and Requests for FY 2001**
- IX. Outreach and Communications Plan**
- X. Appendices**



## I. EXECUTIVE SUMMARY

### **The History of Hatcheries: Management for Production**

Most hatcheries in Puget Sound and Coastal Washington have been in operation for decades and were built to produce fish for harvest, compensating for declines in wild salmon populations. Hatcheries have generally been successful at fulfilling this purpose. They are important to the North Pacific sports and commercial fishing economy and to meeting Indian tribe treaty harvest obligations. However, hatcheries have also been identified as one of the factors responsible for the depletion of wild salmon stocks. Some facilities have produced stresses for wild fish, kept smolts from getting downstream, kept spawning adults from getting upstream and lowered water quality. Physical and genetic interactions between wild and hatchery fish may have weakened the natural stocks. Hatchery management decisions have often been piecemeal, rather than system-wide.

### **The Future of Hatcheries: Management for Sustainable Fisheries and Recovering Wild Stocks**

The listing of several Puget Sound and Coastal stocks under the federal Endangered Species Act (ESA) has put a new spotlight on all activities that may harm wild salmon, including hatchery programs. The state and tribal co-managers of Washington's salmon and steelhead resources must demonstrate that their hatcheries do not present risks to listed species. But the co-managers are seeking to go beyond merely complying with ESA directives that hatcheries be operated to minimize risks to endangered fish. They have embraced a new vision of reforming hatchery programs to provide *benefits* to the process of recovering wild salmon and supporting sustainable fisheries. Although there is a lot to learn about this new approach, enthusiasm is high.

### **The Hatchery Reform Project**

Recognizing this, the U.S. Congress adopted and funded in fiscal year 2000 the recommendations of a science advisory team assembled by U.S. Senator Slade Gorton (R-WA), launching the Puget Sound and Coastal Washington Hatchery Reform Project. The Hatchery Reform Project is a systematic, science-driven redesign of how hatcheries will be used to achieve new purposes: 1) helping to recover and conserve naturally spawning populations and 2) supporting sustainable fisheries. The appropriation language provided funding to:

- Establish an independent scientific panel to ensure a scientific foundation for hatchery reform;
- Provide a competitive grant program for needed research on hatchery impacts;
- Support state and tribal efforts to implement new hatchery reforms; and
- Provide for the facilitation of a reform strategy by an independent third party, to ensure implementation of reform.

The third party facilitator specified by Congress is Long Live the Kings (LLTK), a private, non-profit organization whose mission is to restore wild salmon to the waters of the Pacific Northwest. LLTK's role includes providing facilitation and staff support to the scientific panel and a newly created co-managers' Hatchery Reform Coordinating Committee; as well as helping

## **Hatchery Reform in Puget Sound and Coastal Washington**

the co-managers and the scientific panel communicate hatchery reform progress to Congress, state legislators, stakeholder groups and the public.

The co-managers requested that a Hatchery Reform Coordinating Committee be established to focus on the “big picture” of this effort to reform hatcheries. The Coordinating Committee includes representatives of the tribes, the Washington State Department of Fish and Wildlife (WDFW), the U.S. Fish and Wildlife Service (USFWS), the National Marine Fisheries Service (NMFS), LLTK and Gorton Science Advisory Team members not serving on the Scientific Group. The purpose of the committee is to ensure a successful working relationship between the independent science panel, co-manager leadership and the co-managers’ own hatchery reform science teams and other staff.

### **The Hatchery Scientific Review Group**

The Hatchery Scientific Review Group is the independent scientific panel established by Congress to ensure that hatchery reform programs in Puget Sound and Coastal Washington be scientifically founded and evaluated; that independent scientists interact with agency and tribal scientists to provide direction and operational guidelines; and that the system as a whole be evaluated for compliance with scientific recommendations. The objective of the Scientific Group is to assemble, organize and apply the best available scientific information to provide guidance to policy makers who are implementing hatchery reform.

The Scientific Group is composed of five independent scientists (selected by the Gorton Science Advisory Team from a pool of candidates nominated by the Past Presidents Council of the American Fisheries Society) and four agency scientists designated by the Washington State Department of Fish and Wildlife (WDFW), the Northwest Indian Fisheries Commission (NWIFC), the National Marine Fisheries Service (NMFS) and the U.S. Fish and Wildlife Service (USFWS). Like the independent scientists, the agency scientists are responsible for evaluating scientific merits and are not to represent agency policies. The nine scientists serving on the Scientific Group have a broad range of experience. Their scientific disciplines include biology, genetics, ecology, fisheries management, fish culture, fish pathology, biometrics and other disciplines (see Section VI. for Scientific Group member profiles).

The Scientific Group has met each month since March, 2000. The group has clarified its purpose and goals; set administrative policies and procedures; established itself as a smoothly functioning organization; approved a work plan and timeline for accomplishing objectives; begun development of a scientific framework to inform decision-making; met monthly with the co-managers’ Hatchery Reform Coordinating Committee and reached agreement with the Coordinating Committee on Hatchery Reform purposes, goals and uses of the scientific framework; provided interim consultation to the co-managers; written its report to Congress; reviewed 42 grant applications; and awarded almost \$550,000 for research projects critical to achieving hatchery reform.

A key objective of the Scientific Group during its initial months has been to develop a scientific framework to organize the best available scientific information about hatcheries in Puget Sound and Coastal Washington, for the purposes of repositioning hatcheries and implementing hatchery

## **Hatchery Reform in Puget Sound and Coastal Washington**

reform. The scientific framework will allow the Scientific Group to form and test the hypotheses that will guide research, communicate with other scientists, decision-makers and the public and create a repository of knowledge upon which to base advice to the co-managers. The test for the effectiveness of this scientific framework will be its usefulness to decision-makers.

### **FY 2000 Expenditures and Requests For FY 2001**

Contracts to commence the Hatchery Reform Project and access the \$3.6 million federal FY 2000 funds allocated to it were signed January 10, 2000. The funding provided for hatchery reform in FY 2000 has led to a series of important deliverables, among them:

- The state and tribal co-managers have created a top-tier policy committee committed to working with independent scientists and a private non-profit organization to identify the goals of hatchery reform and encourage its implementation;
- A diverse and accomplished independent scientific panel has been established and is developing the scientific framework that will guide hatchery reform programs;
- A first round of research has been funded—and is being carried out—in order to fill in the knowledge gaps about how hatcheries affect wild stocks;
- The co-managers have acquired new scientific capacity, in the form of agency science teams, needed to complete comprehensive salmon management plans and facilitate hatchery reform;
- State and tribal agencies have the resources to put hatchery programs on the path toward compliance with the Endangered Species Act (ESA), complete Hatchery Genetic and Management Plans as required by the National Marine Fisheries Service (NMFS) for each hatchery affecting a listed species in Washington, and conduct other activities;
- A new database is being constructed by the state and the tribes that will greatly improve the amount of information available online to hatchery managers and the public. Called HatPro, this database will allow on-site electronic transfer of key hatchery data directly to state, tribal and federal agencies.

After considering the ample progress achieved by all involved parties in the few short months since the project was launched, the Gorton Science Advisory Team has recommended—and the co-managers have concurred—level funding for the Hatchery Reform Project, under the same categories and using the same language for FY 2001, with an additional \$5 million for hatchery capital improvements.

Much progress has been made in the few short months since the Hatchery Reform Project got under way. This will surely rank as one of the most significant years in the last 20 or 30 in terms of decision-making about Washington's hatchery regime. These decisions will, in turn, lead to unprecedented action in the coming years. Most significantly, the co-managers have embraced this new approach of reforming hatchery programs to provide benefits to the process of recovering wild salmon and supporting sustainable fisheries. There is a clear sense among decision makers that with an understanding of the history of hatcheries, a vision for how hatcheries can be managed differently in the future, and a strategic plan that is both comprehensive and based on solid science, there is much cause for optimism about what the Hatchery Reform Project can achieve.

## II. INTRODUCTION

Most hatcheries in Puget Sound and Coastal Washington have been in operation for decades and were built to produce fish for harvest, compensating for declines in wild salmon populations. Hatcheries have generally been successful at fulfilling this purpose. However, they have also been identified as one of the factors responsible for the depletion of wild salmon stocks.

Most of these hatcheries were established in an era of limited scientific information on the effects of hatcheries on wild stocks or even how different elements of the hatchery system affect each other. Many of these questions remain unanswered today. The state and tribal co-managers of Washington's salmon and steelhead resources have made efforts over the past decade to reduce hatchery impacts on wild stocks. However, these hatchery reform efforts have never been applied in a comprehensive, system-wide way.

---

*In some cases, hatchery programs for Pacific salmon have yet to be adequately evaluated, even though they were initiated more than 100 years ago ... We still know very little about the impacts that hatcheries have on the ecosystems they release their fish into and, furthermore, there is little research underway to identify and understand those impacts.*

—Salmon Without Rivers, *Jim Lichatowich*<sup>1</sup>

---

The listing of several Puget Sound and Coastal stocks under the federal Endangered Species Act (ESA) has put a new spotlight on all activities that may harm wild salmon, including hatchery programs. Recognizing this, the U.S. Congress adopted and funded in fiscal year 2000 the recommendations of a science advisory team assembled by U.S. Senator Slade Gorton (R-WA), launching the Puget Sound and Coastal Washington Hatchery Reform Project. The Hatchery Reform Project is a systematic, science-driven redesign of how hatcheries will be used to achieve new purposes: 1) helping to recover and conserve naturally spawning populations and 2) supporting sustainable fisheries.

Much progress has been made in the few short months since the Hatchery Reform Project got under way. This will surely rank as one of the most significant years in the last 20 or 30 in terms of decision-making about Washington's hatchery regime. These decisions will, in turn, lead to unprecedented action in the coming years. Most significantly, the co-managers have embraced this new approach of reforming hatchery programs to provide benefits to the process of recovering wild salmon and supporting sustainable fisheries. There is a clear sense among decision makers that with an understanding of the history of hatcheries, a vision for how hatcheries can be managed differently in the future, and a strategic plan that is both comprehensive and based on solid science, there is much cause for optimism about what the Hatchery Reform Project can achieve.



### III. THE HISTORY OF HATCHERIES: MANAGEMENT FOR PRODUCTION

The North Pacific salmon hatchery system began in the late 19th century. The first salmon hatchery in Washington was built in 1895, on the Kalama River.<sup>2</sup> There have been four distinct phases in the development of the system:

- From the late 1800s to 1970, a rudimentary hatchery husbandry was developed. The hatchery system was playing a prominent role in the enhancement of Pacific Rim salmonid resources by the 1950s.
- From 1970 to 1980, significant technological improvements were made in feed and disease control. New hatcheries were constructed.
- An “industrialization” period took place from 1980 to 1990. Intense fishing, loss of freshwater habitat and declining ocean productivity led to accelerated production and the construction of more hatcheries to mitigate for these losses and enhance runs.
- The 1990s featured a “post-industrialization” period. Survival rates of hatchery fish declined and hatchery escapement goals were not reached. Reduced budgets resulted in declining chinook, coho and steelhead production in the Pacific Northwest and Canada. At the same time, high production in the North Pacific for chum and pink salmon and the fast-growing farm salmon fishery reduced revenues to fishers. This resulted in a leveling off or reduction of hatchery releases for these species.

There are approximately 100 hatchery facilities in Puget Sound and Coastal Washington being operated by the Washington State Department of Fish and Wildlife (WDFW), Puget Sound and Coastal Indian Tribes, and the U.S. Fish and Wildlife Service (USFWS). WDFW operates 81 major hatcheries, with 60 rearing salmon at some life-stage (the rest rear game fish exclusively—trout, steelhead or other warm water species). Puget Sound and Coastal treaty tribes have around 20 major salmon rearing facilities, and 25 smaller satellite or acclimation sites. USFWS operates eleven major hatcheries in Washington, all for salmon production.<sup>3</sup>

#### **Roles and Benefits of Hatcheries**

Hatcheries are very important to the North Pacific sports and commercial fishing economy. In 1992, production for all species at Pacific Rim hatcheries totaled more than 5.5 billion fry, fingerlings and smolts released. In 1999, more than 17 million chinook, coho and steelhead were released into Washington’s coastal waters. In the Hood Canal and Puget Sound areas, more than 88 million chinook, chum, coho, sockeye, pink and steelhead were released.<sup>4</sup> Hatcheries provide over 90% of the inland catch of resident salmonids,<sup>5</sup> approximately 75% of all coho and chinook, and 88% of all steelhead harvested statewide.<sup>6</sup> According to a recent Pacific Fishery Management Council model, hatchery coho average around 70% of the regional coho fisheries of Washington and Oregon for 14 stock groups. For four of these stocks, hatchery fish constitute 95–100% of the catch. Twelve of the 14 have a contribution from hatcheries of greater than 25%.<sup>7</sup>

Coastal communities, some already hard hit by the decline in timber, have been struggling with the economic disasters caused by fishery closures. In 1994, six counties in Washington were declared economic disaster areas because of fishing closures; the estimated impact to the counties was over \$5 million in one year. Small businesses such as fishing resorts, marinas, bait shops,

## **Hatchery Reform in Puget Sound and Coastal Washington**

commercial fishing operations, fish buyers, boat builders, and charter fishing offices are gone or in severe financial straits. Hatcheries are very important to these communities and businesses when managed as a source of sustainable fisheries.<sup>8</sup>

By maintaining salmon and steelhead fishing opportunities while efforts to rebuild troubled stocks move forward, hatcheries help ensure that there is a fishing constituency to support salmon recovery. Without fisheries, many sports and commercial fishers, boat builders, resort owners and other citizens might lose interest and/or hope in the fate of the salmon. The next generation might grow up without the experience of interacting with these remarkable fish.

Hatcheries also play an important role in meeting tribal treaty harvest obligations. Federal court rulings have affirmed tribal treaty harvest rights and established the tribes as co-managers of the salmon resource. These rulings have also affirmed that the tribal treaty right incorporates an environmental right, requiring state and federal governments to prevent salmon habitats from becoming degraded. In other words, state and federal governments must ensure that there are salmon available for the tribes to harvest. One federal court ruling put it this way: “Were this (environmental degradation) trend to continue, the right to take fish would eventually be reduced to the right to dip one’s net into the water and bring it out empty.”<sup>9</sup> As wild salmon stocks declined over the years, the tribes and state and federal governments became dependent on hatcheries to provide a meaningful level of harvest for Indian and non-Indian fishers.

### **Hatcheries As a Factor in the Decline Of Wild Stocks**

Hatchery programs have largely been focused on producing fish for harvest, with relatively little attention being paid to the potential for adverse effects on wild fish. Because of this, hatcheries have also been identified as one of the factors responsible for the depletion of wild salmon stocks. Hatchery management decisions have often been piecemeal, rather than system-wide. Some hatcheries have a permanent rack or weir across the stream that diverts both hatchery and wild returning salmon into the hatchery. While these may be necessary to segregate hatchery fish from wild fish, this diverting, collecting and sorting can delay and stress wild fish during their critical migration upstream. Water intakes at some hatcheries trap wild smolts during their migration downstream, or block upstream passage of returning adults. In addition, sufficient funding has not been provided to meet federal water quality standards at all facilities.

Interbreeding of hatchery and wild fish may result in deleterious genetic effects. Competition for resources such as food and space may reduce the number of wild fish the habitat can sustain. Predation on wild fish by fish released from hatcheries may reduce the abundance of wild populations. In addition, the large numbers of hatchery fish produced have led to an over-harvest of less productive, natural-origin stocks. Historically, these hatchery fish have also been indistinguishable from wild fish, “masking” the status of the natural population and the health of the habitat.

## **IV. THE FUTURE OF HATCHERIES: MANAGEMENT FOR RECOVERING WILD STOCKS AND SUPPORTING SUSTAINABLE FISHERIES**

## Hatchery Reform in Puget Sound and Coastal Washington

A recent survey by state and tribal biologists found that less than half of Washington's salmon and steelhead stocks are healthy.<sup>10</sup> With several Puget Sound and Coastal stocks listed or proposed for listing under the federal Endangered Species Act (ESA), producing fish for harvest can no longer be the sole purpose of hatcheries. As part of a larger recovery process, the state and tribal co-managers of Washington's salmon and steelhead resources must demonstrate that their hatcheries do not present risks to listed species.

But the co-managers are seeking to go beyond merely complying with ESA directives that hatcheries be operated to minimize risks to endangered fish. They have embraced a new vision of reforming hatchery programs to provide *benefits* to the process of recovering wild salmon and supporting sustainable fisheries. Although there is a lot to learn about this new approach, enthusiasm is high.

---

***The co-managers have embraced a new vision of reforming hatchery programs to provide benefits to the process of recovering wild salmon and supporting sustainable fisheries.***

---

The National Marine Fisheries Service (NMFS) establishes an Evolutionarily Significant Unit (ESU) for each species considered for listing under the ESA.<sup>11</sup> ESUs formally listed at this time include Puget Sound chinook salmon, Lake Ozette sockeye salmon, Puget Sound bull trout, and Hood Canal summer chum salmon. Coastal cutthroat trout are proposed for listing and Southwest Washington coho salmon are a candidate for listing. NMFS manages recovery planning for salmon stocks. Planning for trout is managed by the U.S. Fish & Wildlife Service (USFWS).<sup>12</sup>

Alongside all other factors that may affect wild salmon, hatchery operations in the watersheds where these ESUs reside are subject to scrutiny. The ESA provides two primary vehicles through which state, federal and tribal hatchery operators can establish compliance with the law. Under Section 7 of the ESA, federally funded projects (tribal hatcheries with Bureau of Indian Affairs funding and USFWS hatcheries) must consult with either NMFS or USFWS to develop a Biological Opinion assuring those hatcheries' actions will not jeopardize the listed stock. State-managed hatchery programs follow a similar planning process under either Section 4(d) or Section 10 of the ESA.

The primary tool the federal government is using for evaluation of individual hatcheries in these processes is a document created for this purpose called a Hatchery and Genetic Management Plan (HGMP). HGMPs will be used in conjunction with an ESU-wide plan that evaluates all hatchery operations in a cumulative manner. Tribal, state and federal hatchery operators are currently gathering and analyzing information for their HGMPs. These plans will be completed by early summer of 2000. NMFS expects to complete Biological Opinions for individual ESUs this year.

Recognizing that harvest, habitat and hatcheries cannot be addressed in isolation, the co-managers are responding to declining wild salmon populations and ESA listings with improved planning processes like the Comprehensive Coho and Comprehensive Puget Sound

## Hatchery Reform in Puget Sound and Coastal Washington

Chinook Management Plans. While these planning processes were originally developed to improve harvest management, the co-managers now see them as having the potential to provide a management framework for the implementation of hatchery reform, in concert with other reforms.

Comprehensive Coho and Comprehensive Puget Sound Chinook were designed to change the way salmon are managed by moving away from relying solely on a fixed escapement target. They seek to protect and restore adequate freshwater habitat and ensure that enough adult salmon reach the spawning grounds to recover the stocks. The goal is to restore the productivity and diversity of wild salmon stocks from Puget Sound and the Washington coast to levels that can support both treaty and non-treaty fisheries.

Comprehensive Puget Sound Chinook looks beyond meeting the “jeopardy” requirements of the ESA and toward chinook recovery. Involving NMFS, the Washington State Department of Fish and Wildlife (WDFW), and the tribes, the process has several components: 1) The identification of criteria for delisting each population category, to include abundance trends, genetic diversity and distribution of native species (expected June to August 2000); 2) The identification of overall factors for decline of Puget Sound Chinook (expected June to August 2000); 3) The development of regional management plans that outline what recovery means for each watershed including hatcheries, harvest (escapement) and habitat (currently in varying stages of implementation).

Recovery goals and comprehensive recovery plans are being developed for all salmon species in western Washington. Specific recovery plans are being developed for each watershed to guide how harvest, habitat and hatcheries will be managed. These new management plans are intended to be flexible and adaptive, with the ability to incorporate new information as it becomes available. They are also assessment-oriented, with performance-based annual monitoring. Ecological interactions and carrying capacity are generally unknown at watershed and ESU levels, so the effort is based on local knowledge. Expected completion date is December 2000.

## V. THE HATCHERY REFORM PROJECT

In 1998, U.S. Senator Slade Gorton (R-WA) convened a group of leading scientists representing federal, state and tribal agencies to advise him on salmon hatchery reform. In May 1999, this Gorton Science Advisory Team presented its recommendations in a report entitled *The Reform of Salmon and Steelhead Hatcheries in Puget Sound and Coastal Washington to Recover Natural Stocks While Providing Fisheries* (see Appendix A, *Gorton Science Advisory Team Report*). The report determined that the potential exists for hatcheries to have a major, positive impact on the recovery of wild salmon, in just a few years and at relatively small costs. It called for a comprehensive hatchery reform effort led by a panel of independent scientists to conserve indigenous genetic resources; assist with the recovery of naturally spawning populations; provide for sustainable fisheries; conduct scientific research; and improve the quality and cost-effectiveness of hatchery programs.

---

***The potential exists for hatcheries to have a major, positive impact on the recovery of wild salmon, in just a few years and at relatively small costs.***

***— Gorton Science Advisory Team***

---

With the support of Senator Gorton, U.S. Congressman Norm Dicks (D-WA), and Washington Governor Gary Locke, the U.S. Congress adopted and funded the Gorton Science Advisory Team's recommendations for fiscal year 2000, launching the Puget Sound and Coastal Washington Hatchery Reform Project (see Appendix B, *Hatchery Reform FY 2000 Appropriation*). The project has two purposes: 1) helping to recover and conserve naturally spawning populations and 2) supporting sustainable fisheries. The appropriation language provided funding to:

- Establish an independent scientific panel to ensure a scientific foundation for hatchery reform;
  - Provide a competitive grant program for needed research on hatchery impacts;
  - Support state and tribal efforts to implement new hatchery reforms; and
  - Provide for the facilitation of a reform strategy by an independent third party, to ensure implementation of reform.
- 

***(H)atcheries should no longer be viewed solely as factories for producing fish. Hatcheries should also be thought of as laboratories that can provide controlled environments for studying juvenile fish and for testing treatments to improve our understanding of what happens to juveniles after they leave spawning areas. Seen in that light, hatcheries can be a powerful tool for learning about salmon.***

***—Upstream, National Research Council Committee on Protection and Management of Pacific Northwest Anadromous Salmonids<sup>13</sup>***

---

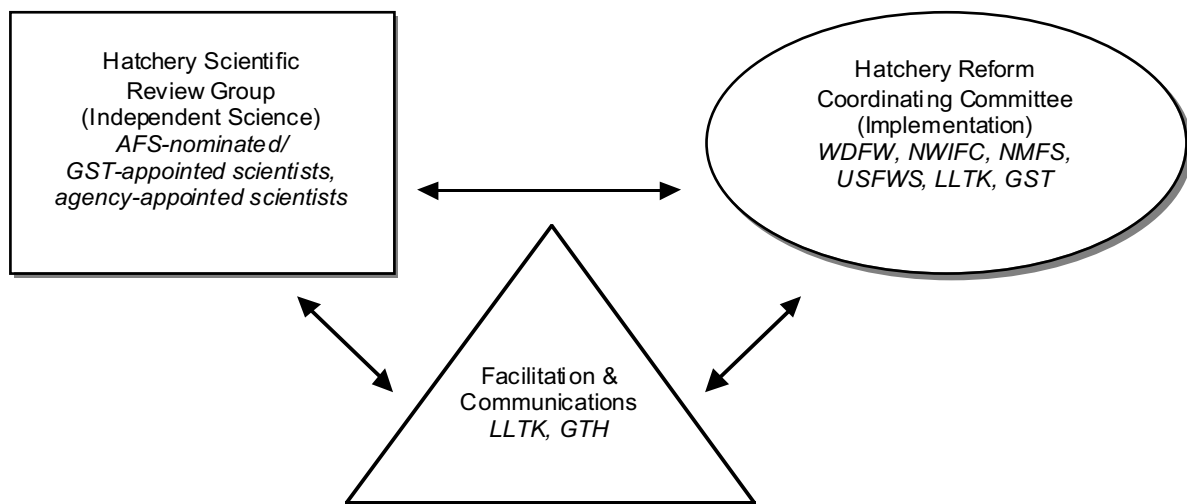
This approach represents the first time Puget Sound and Coastal Washington hatchery management decisions are to be based on system-wide, scientific recommendations, providing an important model that can be replicated in watersheds outside the region. In the past, hatchery programs were largely assumed to be successful unless demonstrated otherwise. In the future, hatchery reform will mean the burden of proof is shifted. Each program, hatchery or tested variable will be treated as a scientific hypothesis or experiment, not as a presumed solution. Evaluating the outcomes of those experiments will determine whether programs are replicated, modified or replaced.

The third party facilitator specified by Congress is Long Live the Kings (LLTK), a private, non-profit organization whose mission is to restore wild salmon to the waters of the Pacific Northwest. LLTK's role includes providing facilitation and staff support to the scientific panel and a newly created co-managers' Hatchery Reform Coordinating Committee (see Appendix C, *Hatchery Reform Coordinating Committee Contact List*); as well as helping the co-managers and the scientific panel communicate hatchery reform progress to Congress, state legislators, stakeholder groups and the public.

## Hatchery Reform in Puget Sound and Coastal Washington

LLTK is uniquely qualified to facilitate this project as an independent organization with fifteen years of experience testing innovative—and sometimes experimental—approaches for using hatcheries to help recover wild runs. Because the state, the tribes, federal agencies and the private sector have been regular partners in LLTK’s projects, the organization is familiar to and trusted by the various entities that must work cooperatively for the Hatchery Reform Project to succeed. In addition, LLTK has strong staff expertise in public policy facilitation, coordination, strategic planning and communications. LLTK has subcontracted with the Tacoma-based law firm Gordon, Thomas, Honeywell for additional professional facilitation services.

### Hatchery Reform Project Partners



*AFS = American Fisheries Society; WDFW = Washington State Department of Fish and Wildlife; NMFS = National Marine Fisheries Service; NWIFC = Northwest Indian Fisheries Commission; USFWS = United States Fish and Wildlife Service; LLTK = Long Live the Kings; GST = Gorton Science Advisory Team; GTH = Gordon, Thomas, Honeywell*

## VI. THE HATCHERY SCIENTIFIC REVIEW GROUP

The Hatchery Scientific Review Group is the independent scientific panel established by Congress to ensure that hatchery reform programs in Puget Sound and Coastal Washington be scientifically founded and evaluated; that independent scientists interact with agency and tribal scientists to provide direction and operational guidelines; and that the system as a whole be evaluated for compliance with scientific recommendations. The objective of the Scientific Group is to assemble, organize and apply the best available scientific information to provide guidance to policy makers who are implementing hatchery reform.

---

***The Hatchery Scientific Review Group is the independent scientific panel established by Congress to ensure that hatchery reform programs in Puget Sound and Coastal Washington be scientifically founded and evaluated.***

---

## Hatchery Reform in Puget Sound and Coastal Washington

The Gorton Science Advisory Team called for an independent scientific panel not to directly conduct experiments, but to work with the agencies to determine what science is needed, to oversee its completion, and to assure that the results are reported in meaningful terms to policy makers and other scientists. They considered an independence level equivalent to academic freedom to be essential for this panel, because its scientific results must not be directed by inappropriate political considerations.<sup>14</sup> For this reason, they called for the majority of the scientific panel to be independently employed rather than by the agencies involved; for the panel's chair to come from these independent members; and for the agency scientist members to evaluate scientific merits and not represent agency policies. The appropriations language affirmed these principles and they have been carried through in the establishment of the Scientific Group.

The Scientific Group is composed of five independent scientists (selected by the Gorton Science Advisory Team from a pool of candidates nominated by the Past Presidents Council of the American Fisheries Society) and four agency scientists designated by the Washington State Department of Fish and Wildlife (WDFW), the Northwest Indian Fisheries Commission (NWIFC), the National Marine Fisheries Service (NMFS) and the U.S. Fish and Wildlife Service (USFWS).

The nine scientists serving on the Scientific Group have a broad range of experience. Their scientific disciplines include biology, genetics, ecology, fisheries management, fish culture, fish pathology, biometrics and other disciplines. Members include (\* = independent scientist, + = agency scientist; see Appendix D, *Hatchery Scientific Review Group Biographical Information* for more detail):

- John Barr, Salmon Restoration Program Supervisor, Nisqually Indian Tribe, representing the tribes of the NWIFC. Expertise includes the artificial production of salmon; planning, designing and operating fish rearing facilities; development of regional and species management and production plans; hatchery programs and operating guidelines.+
- Lee Blankenship (Vice Chair), Senior Research Scientist, WDFW. Expertise includes developing and evaluating stock identification tools, development of the coded wire tag and marine stock enhancement.+
- Donald Campton, PhD, Regional Geneticist, USFWS Abernathy Fish Technology Center Longview, Washington. Expertise includes genetics, fisheries and aquatic sciences.+
- Trevor Evelyn, PhD, Head of Fish Health and Parasitology Section, Department of Fisheries and Oceans Canada (retired, Scientist Emeritus). Expertise includes fish immunology, epizootiology, fish disease diagnosis and fish disease control.\*
- Conrad Mahnken, PhD, Program Manager and Laboratory Director, NMFS Manchester, Washington Research Station. Expertise includes new conservation and enhancement strategies and technologies for Pacific salmon populations, aquaculture, biology and oceanography.+
- Lars Mobrand, PhD (Chair), President, Mobrand Biometrics. Expertise includes ecosystem planning, resource restoration, cumulative impact analysis, facilitation of cooperative resource planning projects and inter-tribal harvest allocation issues.\*

## Hatchery Reform in Puget Sound and Coastal Washington

- Robert Piper, Director USFWS Fish Technology Center, Bozeman, Montana (retired). Expertise includes fisheries biology, effects of hatchery environments on fish quality, hatchery design criteria, hatchery carrying capacity standards and fish production procedures.\*
- Lisa Seeb, PhD, Principal Geneticist, Gene Conservation Laboratory, Alaska Department of Fish & Game. Expertise includes the use of molecular genetic methods to improve management of wild and hatchery populations of salmonids and marine fishes.\*
- William Smoker, PhD, Professor of Fisheries, School of Fisheries and Ocean Sciences, University of Alaska. Expertise includes the biology of Pacific Salmon, particularly on aspects related to conservation and artificial culture.\*

### Scientific Group Meetings to Date

The Long Live the Kings (LLTK)/Gordon, Thomas, Honeywell facilitation team arranged and staffed the first three-day Scientific Group workshop in March 2000, helping the group get established, clarify its purpose and goals, establish a work plan and timeline for accomplishing its objectives, begin creation of a scientific framework, set up a competitive grants program and coordinate its efforts with the co-managers. The Scientific Group reviewed 42 grant applications at its March meeting and awarded (based on the most explicit needs) \$457,372 for scientific research projects to inform decisions critical to achieving hatchery reform. The group deferred consideration of an additional \$200,000 worth of projects until its April 2000 meeting, pending further information gathering.

In April, the Scientific Group met to continue the development of its scientific framework and work plan and to act on deferred grants, awarding an additional \$90,000 for a total of \$547,372 (which was matched by \$645,672 from grant recipients). The group also met with agency decision-makers and science teams and voted to retain the facilitation team through the end of the year (the original agreement was that LLTK would help the Scientific Group get established and then return exclusively to its work with the co-managers and Hatchery Reform Project communications).

At its May meeting, the Scientific Group completed draft scientific framework definitions and clarifying questions (see Appendix E, *Draft Outline of HSRG Framework*); approved a long-term work plan (see Appendix F, *Scientific Group Work Plan*); adopted a set of policies and procedures (see Appendix G, *Scientific Group Policies and Procedures*); and reviewed its report to Congress (see Appendix H, *Scientific Group Meeting Summaries*).

### Creating a Scientific Framework for Hatchery Reform

Reforming hatcheries to support both sustainable fisheries and conservation/recovery goals will require testing both new concepts and old assumptions. All hatchery programs will need to be treated as separate but related experiments in which causes, effects and results are closely monitored within a scientific, hypothesis-testing framework. Only within such a framework can successes and failures be identified and understood.<sup>15</sup> Agreeing upon a set of criteria for assessing these successes and failures will be as important as the design of monitoring and evaluation programs necessary for obtaining the required data.



With this in mind, a key objective of the Scientific Group during its initial months has been to develop a scientific framework to organize the best available scientific information about hatcheries in Puget Sound and Coastal Washington, for the purposes of repositioning hatcheries and implementing hatchery reform. The scientific framework will allow the Scientific Group to form and test the hypotheses that will guide research, communicate with other scientists, decision-makers and the public and create a repository of knowledge upon which to base advice to the co-managers. It will record questions previously asked and addressed, so that acquired wisdom is retained and there is no need to cover old ground. Another key purpose will be to point out knowledge gaps and how information is related and linked.

The Scientific Group intends to provide credible scientific information to inform hatchery management decisions and allow action, while maintaining a healthy understanding of the uncertainty that must accompany any attempt to quantify a complex environmental system. The flexibility and adaptive management required to respond effectively to that uncertainty is exactly what makes a solid scientific framework such an important tool and why the Scientific Group has chosen to make establishing the framework the focus of its early efforts. For example, the policy-makers plan to bring their strategic plans for reforming hatcheries to the Scientific Group for evaluation. This evaluation will be done in the context of the scientific framework.

The framework will be organized around the question, “What does it take for hatcheries to be successful in helping to restore wild salmon and support sustainable fisheries?” It includes four major conditions identified by the Scientific Group as necessary for hatcheries to succeed in their new goals: 1) healthy/viable hatchery populations; 2) access to harvestable fish; 3) benefiting (or not adversely affecting) natural populations and their environments; and 4) accountability for performance in terms of benefits, biological risks, and costs (see Appendix E, *Draft Outline of HSRG Framework*). Each condition has two dimensions: 1) genetics and 2) environment (including both the hatchery environment and the natural environment).

This framework will be unique because it will be about not just minimizing risks, but also fostering benefits from hatcheries. It will consider whether or not the success or failure of these conditions can be monitored and will also identify what actions can be taken to meet the desired conditions (See Appendix I, *Scientific Framework Organization*). The scientific framework will be a living construct, to be periodically modified and improved as new information is acquired.

An example of how the scientific framework will be used would be to first identify the effects of hatchery programs on native stocks, ecosystems and their populations. These effects could occur in three general ways: 1) via physical structures; 2) via ecological interactions and; 3) via genetic mechanisms. A further break down of hatchery structures would show that they may have severe adverse effects on wild populations by creating obstacles to migration, changes in instream flows and/or loss of stream water quality from hatchery effluent. Obstacles to migration and other factors could be measured and actions identified to remedy the adverse effects identified.

---

***Recovery will only be successful if the best available science is used to determine existing conditions and guide priorities for action. There are a lot of unknowns about salmon recovery***

*but science can help us minimize the level of risks and uncertainty as we move forward. Science can also help us monitor the results of our efforts over time and provide insight for adapting our approach.*

*—William Ruckelshaus, Chairman, Washington State Salmon Recovery Funding Board, April 20, 2000*

---

The test for the effectiveness of this scientific framework will be its usefulness to decision-makers. The Scientific Group has considered what uses the completed scientific framework should have for the co-managers and presented its results to the Coordinating Committee at its April meeting. The Coordinating Committee agreed with the Scientific Group's list of potential uses, which include ESA and recovery planning; long-term hatchery reform planning; species plans that integrate hatcheries with harvest and habitat; identification of critical research; and others (See Appendix J, *Uses of the HSRG Scientific Framework*).

Draft definitions and clarifying questions for the scientific framework have been completed and are attached (see Appendix E, *Draft Outline of HSRG Framework*). The Scientific Group has adopted a long-term work plan, which explains how and when it intends to complete the scientific framework and use it as the basis of the recommendations and research priorities to guide hatchery reform efforts in the coming months and years (see Appendix F, *Hatchery Scientific Review Group Work Plan*). The draft framework will be completed by the end of July, 2000. It will then undergo an informal review by other scientists while the Scientific Group conducts its own test to determine if the framework is complete and serves a useful purpose to the co-managers. Following this review, the framework will be modified, if necessary and distributed to the co-managers and the interested public for review.

The final draft scientific framework is due to be completed by October, 2000. At that point, the Scientific Group will be able to identify research priorities and make decisions on future research grants in November, 2000. Beginning the first half of 2001, the group will focus on a long-term strategic plan to reform hatcheries. Activities will include reviewing hatchery practices; making initial decisions on adaptive management and monitoring and evaluation; providing guidance in preparing species plans; and providing operational guidance to the co-managers. The scientific framework will be subject to periodic scientific reviews to refine it and verify that it is still serving its purposes.

Although the task of providing a comprehensive, scientific foundation for hatchery reform in Puget Sound and Coastal Washington is a large one, Scientific Group members feel there is cause for optimism if the process continues to be conducted with care and intelligence and if the resulting decisions are supported by credible, scientific information.

### **Funding Hatchery Reform Research**

The Gorton Science Advisory Team recognized the need for Hatchery Reform Project research proposals to be submitted prior to the formation of the Hatchery Scientific Review Group. They distributed a call for preproposals in December 1999 (see Appendix K, *Hatchery Scientific Review Group Call for Preproposals*). The Scientific Group reviewed the resulting proposals

after their appointment (the proposals and funding decisions are described in Appendix L, *Scientific Group FY 2000 Proposals and Funding Decisions*).

---

*Under current environmental conditions, many biologists and managers consider artificial propagation to be essential for the continued existence of some listed species. The use of ... propagation techniques that can help recover wild fish must include genetic, physiological, ecological, behavioral and fish cultural insights that can only be acquired through scientific research.*

*—“Science Needs for Pacific Salmon and Related Species,” Subcommittee on Ecological Systems, Committee on Environment and Natural Resources for the White House Council on Environmental Quality, March 31, 2000*

---

In making its decisions, the Scientific Group focused on these early research criteria:

- A. Potential to achieve hatchery reform goals (relevance/likelihood of success);
- B. Scientific merit (experimental design/data validity);
- C. Qualifications of investigators (capability/previous experience/infrastructure support);
- D. Cost-effectiveness (importance of potential results versus proposed budget);
- E. Extent of cooperation between sectors and agencies of the salmon restoration community;
- F. Commitment of other resources to the project (matching contributions).

High priority was given to projects that could 1) explore and demonstrate ways to avoid excessive harvest of wild populations; 2) conserve or enhance genetic diversity in naturally spawning populations; 3) identify adverse ecological interactions between hatchery salmon and wild salmon; or 4) otherwise improve the efficacy of hatchery programs.

The Scientific Group is in the process of establishing its long-term research program. This program will be based on the needs identified by the scientific framework and on how the results from earlier funded research alter the Scientific Group’s understanding of the roles and effects of hatcheries. The Scientific Group plans to host a research symposium, so that acquired knowledge is shared between the group and the scientific community at large.

## **VII. THE HATCHERY REFORM COORDINATING COMMITTEE**

Long Live the Kings (LLTK) convened a meeting in September 1999, at which the state and tribal co-managers of Washington’s salmon and steelhead resources requested that a Hatchery Reform Coordinating Committee be established to focus on the “big picture” of this effort to reform hatcheries. The Coordinating Committee initially included representatives of the tribes, the Washington State Department of Fish and Wildlife (WDFW), LLTK and Gorton Science Advisory Team members not serving on the Scientific Group. Representatives of the U.S. Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS) have since been added (see Appendix C, *Hatchery Reform Coordinating Committee Contact List*).

## Hatchery Reform in Puget Sound and Coastal Washington

The purpose of the Coordinating Committee is to ensure a successful working relationship between the independent science panel, co-manager leadership and the co-managers' own hatchery reform science teams and other staff. Success in this effort to reform hatcheries will mean that wild runs are improved and sustainable fisheries are available during a time of Endangered Species Act restrictions. Achieving these significant results will require that the hatchery management agencies concur with the Scientific Group's recommended actions, that they implement the recommended changes, and that the outcomes are scientifically monitored and evaluated. The Coordinating Committee will be vital to the project's success by encouraging that the scientific recommendations are implemented by the agencies and that all processes and policies affecting hatcheries are reviewed, reconfigured and amended as necessary.

---

***(P)roblems in managing and protecting fish populations are due in part to the failure to articulate divergent interests, goals and values and to address them explicitly.***

***—Upstream, National Research Council Committee on Protection and Management of Pacific Northwest Anadromous Salmonids<sup>16</sup>***

---

The Hatchery Reform Coordinating Committee first met in December 1999. They have since met on the last afternoon of each Scientific Group three-day meeting, in order to remain updated on Scientific Group progress and to coordinate activities.

---

***We are confident that by working together ... we can achieve our goal of returning wild salmon stocks to abundance. Reforming hatchery practices is another step on the road to wild salmon recovery.***

***—Billy Frank, Jr., Chairman, Northwest Indian Fisheries Commission, April 20, 2000***

---

In March 2000, the Scientific Group and the Coordinating Committee agreed upon the purposes, goals, and the outline of the scientific framework for informing decision making and measuring success. They identified tasks, made assignments and set dates for April and May meetings leading up to the June 2000 Report to Congress.

In April, the co-managers and the Scientific Group agreed that the Scientific Group should provide scientific consultation to the co-managers and review completed co-manager plans while developing its scientific framework. The results of this initial consultation will be a policy context for evaluating allowable risk and a consistent, objective method for assessing the risk posed by a hatchery program.

---

***It is critical that the findings of the Hatchery Scientific Review Group are adopted by the co-managers and appropriate federal agencies.***

***—Jeff Koenings, Director, Washington State Department of Fish and Wildlife, April 20, 2000***

---

## Hatchery Reform in Puget Sound and Coastal Washington

In May, the Coordinating Committee received an update on the Scientific Group's progress; agreed to establish a timeline and work plan for long-term uses of the scientific framework; were updated on Hatchery Reform Project outreach and communications efforts; and asked LLTK to help them develop a strategy for state support of hatchery reform, including capital improvements needs.

### VIII. FY 2000 EXPENDITURES AND REQUESTS FOR FY 2001

Contracts to commence the Hatchery Reform Project and access the \$3.6 million federal FY 2000 funds allocated to it were signed January 10, 2000. Significant cooperation and progress has resulted in the short time since then. A critical shift in thinking has resulted in agreement on a new definition and set of purposes for hatcheries in Puget Sound and Coastal Washington, as described above. Achieving these purposes will drive all planning and decision-making to follow and dictate how the design and management of Puget Sound and Coastal hatcheries are implemented.

The funding provided for hatchery reform in FY 2000 has led to a series of important deliverables, among them:

- The state and tribal co-managers have created a top-tier policy committee committed to working with independent scientists and a private non-profit organization to identify the goals of hatchery reform and encourage its implementation;
- A diverse and accomplished independent scientific panel has been established and is developing the scientific framework that will guide hatchery reform programs;
- A first round of research has been funded—and is being carried out—in order to fill in the knowledge gaps about how hatcheries affect wild stocks;
- The co-managers have acquired new scientific capacity, in the form of agency science teams, needed to complete comprehensive salmon management plans and facilitate hatchery reform;
- State and tribal agencies have the resources to put hatchery programs on the path toward compliance with the Endangered Species Act (ESA), complete Hatchery Genetic and Management Plans as required by the National Marine Fisheries Service (NMFS) for each hatchery affecting a listed species in Washington, and conduct other activities;
- A new database is being constructed by the state and the tribes that will greatly improve the amount of information available online to hatchery managers and the public. Called HatPro, this database will allow on-site electronic transfer of key hatchery data directly to state, tribal and federal agencies.

After considering the ample progress achieved by all involved parties in the few short months since the project was launched, the Gorton Science Advisory Team has recommended—and the co-managers have concurred—level funding for the Hatchery Reform Project, under the same categories and using the same language for FY 2001, with an additional \$5 million for hatchery capital improvements (See Appendix M, *Hatchery Reform FY 2001 Appropriations Request and Follow-up Memo*). FY 2000 appropriation expenditures (as reported by each funded entity) and FY 2001 appropriation requests (as recommended by the Gorton Science Advisory Team) for each budget category are detailed in the tables and text below.

## Hatchery Reform in Puget Sound and Coastal Washington

Appropriation for FY 2000	WDFW	NMFS	NWIFC	USFWS	HSRG	LLTK	TOTAL
Independent Scientific Review, Oversight and Planning					\$300,000		\$300,000
Agency Scientists and Assistants to Support Scientific Decision Process	\$400,000	\$100,000	\$200,000	\$100,000			\$800,000
Improving Hatchery Practices	\$675,000		\$675,000	\$50,000			\$1,400,000
Scientific Research	\$100,000		\$100,000		\$700,000		\$900,000
Facilitation & Communication						\$200,000	\$200,000
<b>TOTAL</b>	<b>\$1,175,000</b>	<b>\$100,000</b>	<b>\$975,000</b>	<b>\$150,000</b>	<b>\$1,000,000</b>	<b>\$200,000</b>	<b>\$3,600,000</b>

Request for FY 2001	WDFW	NMFS	NWIFC	USFWS	HSRG	LLTK	TOTAL
Independent Scientific Review, Oversight and Planning					\$300,000		\$300,000
Agency Scientists and Assistants to Support Scientific Decision Process	\$400,000	\$100,000	\$200,000	\$100,000			\$800,000
Improving Hatchery Practices	\$675,000		\$675,000	\$50,000			\$1,400,000
Scientific Research	\$100,000		\$100,000		\$700,000		\$900,000
Facilitation & Communication						\$200,000	\$200,000
Hatchery Improvements	\$3,000,000		\$1,700,000	\$300,000			\$5,000,000
<b>TOTAL</b>	<b>\$4,175,000</b>	<b>\$100,000</b>	<b>\$2,675,000</b>	<b>\$450,000</b>	<b>\$1,000,000</b>	<b>\$200,000</b>	<b>\$8,600,000</b>

*WDFW = Washington State Department of Fish and Wildlife; NMFS = National Marine Fisheries Service; NWIFC = Northwest Indian Fisheries Commission; USFWS = United States Fish and Wildlife Service; HSRG = Hatchery Scientific Review Group; LLTK = Long Live the Kings.*

### Independent Scientific Review, Oversight and Planning (\$300,000 in FY 2000/asking

#### \$300,000 for FY2001)

As directed by Congress, the Hatchery Scientific Review Group has been established, to ensure an independent scientific foundation for hatchery reform. The Scientific Group has held three-day meetings each month since March, 2000 and scheduled two- or three-day meetings for most months over the remainder of the year. The group has clarified its purpose and goals; set administrative policies and procedures; established itself as a smoothly functioning organization; approved a work plan and timeline for accomplishing objectives; begun development of a scientific framework to inform decision-making; met monthly with the Hatchery Reform Coordinating Committee and reached agreement with the Coordinating Committee on Hatchery Reform purposes, goals and uses of the scientific framework; provided interim consultation to the co-managers; written its report to Congress; reviewed 42 grant applications; and awarded almost \$550,000 for research projects critical to achieving hatchery reform.

\$300,000 in FY2001 will ensure the Scientific Group can continue to produce guidelines and set benchmarks for recommended actions; ensure the goals of hatchery reform are carried out; identify scientific needs; and manage a competitive grant program for scientific research relating to hatchery reform. Specifically, this funding supports the independent scientists on the Scientific Group and the administrative costs of the Scientific Group.

### Agency Scientists and Assistants to Support Scientific Decision Processes (\$800,000 in FY 2000/asking \$800,000 for FY2001)

The Scientific Group and the Coordinating Committee agree that after establishing the purposes

## **Hatchery Reform in Puget Sound and Coastal Washington**

and goals of hatchery reform, the next step must be to establish and understand the baseline. Then they can build an implementation plan to get the co-managers from where they are to where they want to be. The co-managers have committed to completing Hatchery Genetic Management Plans (HGMPs) for each species at each of the approximately 100 hatcheries in Puget Sound. These plans will not only provide a picture of how stocks and hatcheries are currently being managed, but may also be a mechanism through which reform can be implemented at individual hatcheries.

The Scientific Group has identified completion of the HGMPs as a top priority. NMFS will also rely on completed HGMPs as the basis for its decisions about the degree to which hatchery practices in Puget Sound and coastal Washington constitute “take” of listed salmonids. HGMPs are due to be completed by July 31, 2000. By that same date, a prioritized list of needed facility modifications is to be completed, along with suggested changes to rearing and release protocols. The co-managers hope to integrate their plans for a complete picture of how and to what ends hatcheries are being managed in Puget Sound and the coast by September 30, 2000.

WDFW Hatchery Reform funds have been supplemented with \$300,000 in state funds to support an agency science team to evaluate and improve hatchery management practices with a science-based decision-making process. The team is organized under Lee Blankenship’s supervision within the Science Division, under the Fish Management Program. The team has adopted the acronym HEAT (Hatchery Evaluation and Assessment Team). HEAT personnel include four biologists, a research scientist, a biometrician, a HGMP coordinator and a hatchery complex manager. The initial focus of HEAT has been to develop HGMPs for each WDFW hatchery in Puget Sound and on the coast. The team has also begun to work with WDFW hatchery managers and area biologists to design and implement experiments at WDFW hatcheries testing methods to increase survival of hatchery fish, reduce interactions with wild fish, and increase knowledge regarding the overall impacts of hatchery programs on wild stocks.

The tribes of the NWIFC have used the FY 2000 funds for purposes similar to WDFW’s, although they have been allocated somewhat differently. The first use of the funds has been for the development of a tribal science team within the Enhancement Services Division at the NWIFC. The team is staffed at NWIFC under the supervision of Dr. Ken Currens. The team consists of a geneticist, a biometrician and an enhancement ecologist. The geneticist will provide technical support for commission and tribal staffs in issues involving genetics and salmon recovery, including uses of hatchery programs; planning, implementation, monitoring and hatchery research; risk assessment; and mixed stock fishery analysis using genetic data. The enhancement ecologist will provide technical support for tribal programs in issues that involve ecology and artificial production, including the role of fish behavior, interspecies interactions and habitat in hatchery programs; planning, implementation, monitoring and research for hatchery activities; risk assessment; and improvements in fish culture. The biometrician will provide technical support for commission and tribal enhancement staffs on experimental design and monitoring, statistical analysis and database maintenance.

Monies going to NMFS have been used for 1) Salary support for the participation of an agency scientist (Dr. Conrad Mahnken) on the Scientific Group; and 2) Staff support for Dr. Mahnken’s service on the Scientific Group, including library research, data processing, salaries, travel,

## **Hatchery Reform in Puget Sound and Coastal Washington**

supplies, materials and utilities.

Funds going to USFWS were allocated to the following projects: 1) Development of a database to track hatchery stock histories and support future management decisions regarding hatchery production; 2) Watershed investigations and white papers regarding suitability of salmon habitat above Quinalt, Quilcene and Makah hatcheries to support fish passage; 3) Operation of an egg isolation unit to support production of listed summer chum salmon; 4) Development of an egg isolation unit using an existing building; 5) Modification of a weir to allow steelhead passage at low flow; 6) Selective fishery evaluation to support hatchery production and recreational fishing for coho salmon; and 7) Support for the participation of an agency scientist (Dr. Donald Campton) on the Scientific Group.

\$800,000 in FY 2001 will fund continued participation on the Scientific Group by WDFW, NWIFC, USFWS and NMFS scientists. It will also ensure that the scientific teams assembled by WDFW and NWIFC can complete any necessary revisions to the HGMPs. These plans are being seen as a likely mechanism by which hatchery reforms can be implemented and NMFS expects that “second generation” HGMPs will be needed at many facilities for this purpose. In addition, this funding will support the agencies’ work to generate and maintain scientific databases; analyze existing data; determine and undertake needed experiments; purchase scientific equipment; develop technical support infrastructures; and initiate changes to hatcheries based on their findings. It is expected that these teams will work closely with the Scientific Group on developing and applying methods for monitoring and measuring success.

### **Improving Hatchery Practices (\$1,400,000 in FY 2000/asking \$1,400,000 for FY2001)**

Hatchery Reform is not happening in a vacuum. For the last several years, the co-managers have recognized the need to minimize adverse genetic and other ecological impacts of hatchery fish in the wild. They have also created policies to minimize and avoid disease at hatcheries and to increase survival. For FY 2000, Congress appropriated \$1.4 million to be divided between WDFW and NWIFC (with \$50,000 to the USFWS) to create and begin implementing new performance objectives, new monitoring and evaluation programs, staff training and to make initial improvements at the hatcheries themselves. The agencies and the Scientific Group are in the midst of a decision-making process to determine how this money will be spent in 2000.

WDFW is using \$60,000 in FY 2000 federal funds to support final development and installation of the new HatPro database between WDFW and tribal hatcheries. This program is in testing form and will be used by both tribal and WDFW facilities as a hatchery management tool and consistent database for hatchery records.

WDFW has committed another \$90,000 to modify existing hatchery facility on the Deschutes River in southern Puget Sound to measure (and identify a causal factor for) differences in reproductive competence between hatchery and wild chinook salmon. WDFW and the tribes are also developing a list of structural changes to hatcheries (retrofitting) that need to occur to minimize genetic and ecological impacts upon wild populations. The needed modifications are being prioritized based on scientific criteria. This process has identified seven WDFW facilities that require immediate attention, due to poorly-screened water intakes that allow wild juvenile



## **Hatchery Reform in Puget Sound and Coastal Washington**

salmon to enter and be trapped in the hatchery facility. \$28,000 have been allocated to fix these screens.

NWIFC has committed \$10,000 of the FY 2000 funds to complete development of HatPro, in conjunction with WDFW. Training for this software will be provided in August 2000. NWIFC has also used FY 2000 funds for the technical staffs of member tribes to complete HGMPs for all hatchery programs. Each tribe is completing these plans, with the assistance of NWIFC staff.

\$1.4 million in FY 2001 funding will enable the agencies to implement the recommendations of the HSRG through the HGMPs. Because these changes need to be made in concert with the recommendations of the Scientific Group, a more complete assessment of what's needed will be available by October 2000.

USFWS funds received under this category are described in the previous section.

### **Scientific Research (\$900,000 in FY 2000/asking \$900,000 for FY2001)**

The Scientific Group's ability to recommend specific strategies that will most effectively achieve hatchery reform goals is compromised by lack of scientific certainty on many subjects. The Scientific Group has prioritized research needs and awarded over \$550,000 of FY 2000 funds in a competitive grant program to research projects that will help answer questions such as how to reduce harvest on wild fish, how to avoid adverse genetic effects of hatchery fish on wild stocks, how to avoid adverse ecological interactions, how to improve hatchery practices, and how to monitor and measure success. The rationale, criteria and methods of evaluation used for the FY 2000 program are provided in Appendices K and L, *Hatchery Scientific Review Group Call for Preproposals* and *Hatchery Scientific Review Group FY 2000 Proposals and Funding Decisions*.

Scientific expertise is also needed at WDFW and NWIFC to explore genetic and ecological interactions of hatchery programs and wild production. Analytical expertise is needed to provide guidance on types of interactions to explore, as well as necessary modeling protocols, to provide information for future improvements. FY 2000 funds of \$100,000 are being used by WDFW to explore and test hypotheses that create or simulate more natural conditions for rearing hatchery fish. Examples include using two-year-old steelhead smolts, growth stimulation wild coho and elemental diet composition simulation. Without these funds, the agency would likely have only had the resources to do what was necessary for minimal compliance with ESA. NWIFC used the \$100,000 of FY 2000 funds in this category to help support its agency science team.

The research needs being overseen by the Scientific Group will not end in FY 2000. There will be many questions left to answer and a number of projects that will take more than one year to bear scientific fruit.<sup>17</sup> Future appropriations will fund the scientific investigations necessary to resolve key technical issues regarding hatchery programs. They will also fund the necessary changes in hatchery programs, training and facility modifications to implement hatchery reform. FY 2001 funding of \$700,000 will enable a second year of competitive grant awards for independent scientific research related to hatchery reform. An additional \$100,000 each will go to WDFW and NWIFC for in-house scientific research. Decisions about how to spend that \$200,000 to greatest effect will be made based on the recommendations of the Scientific Group.

**Facilitation and Communication (\$200,000 in FY 2000/asking \$200,000 for FY2001)**

## **Hatchery Reform in Puget Sound and Coastal Washington**

Congress recognized that the creation of an independent scientific panel would not in itself ensure implementation of hatchery reform. In addition, the co-managers had already embarked upon their own response to the ESA listings and were already considering how to go beyond compliance with the law to achieve long-term recovery. It was critical that the co-managers embrace this new, independent, scientific process. Congress created a bridge and offered support to the co-managers by directing LLTK to “facilitate the co-managers’ design and implementation of hatchery reform.”

With FY 2000 funds, LLTK assembled a facilitation team consisting of Betsy Daniels (and then Michael Kern), Kathy Hopper and Barbara Cairns of Long Live the Kings; and Jim Waldo and Barbara J. Mirk of Gordon, Thomas, Honeywell. This team has successfully facilitated the formation and deliberations of the Coordinating Committee (see Section VII., *Hatchery Reform Coordinating Committee*) and the formation and work products of the Scientific Group (see Section VI., *Hatchery Scientific Review Group*). Additionally, LLTK has assumed responsibility for creating an outreach and communications strategy to ensure that the co-managers’ design and implementation of hatchery reform is informed by and communicated to stakeholders, the state legislature, the public and Congress (see Section IX., *Outreach and Communication Plan* and Appendix M, *Hatchery Reform Outreach and Communication Plan*).

\$200,000 in FY2001 will enable LLTK to continue its coordination, facilitation and communications work on behalf of the co-managers and the HSRG as they continue to refine and implement hatchery reform.

### **Hatchery Improvements (not funded in FY 2000/asking \$5 million for FY 2001)**

The state of Washington and the Washington Treaty Tribes operate the largest system of hatcheries in the world. Puget Sound and coastal hatcheries were created—almost exclusively—for one purpose, to produce fish for harvest. The Hatchery Reform Project changes that purpose. To manage and operate a system of hatcheries designed for production to provide for sustainable fisheries and the recovery and conservation of naturally spawning populations will require extensive capital improvements.

Some hatcheries are themselves physical impediments to upstream migration of wild fish. Many hatcheries cannot accommodate the need to mark all hatchery fish to differentiate them from wild fish. In cases where hatcheries are being retrofitted to help recover wild stocks, the co-managers will need acclimation ponds to encourage fish to return to areas of the watershed more suited to natural reproduction and weirs or traps to provide wild fish for use in the hatchery and acclimation ponds. Where hatcheries fail to meet water discharge standards, pollution abatement facilities must be provided or existing facilities replaced.

\$5 million in FY 2001 will enable WDFW and NWIFC to tackle the most immediate and critical facility needs, in order to achieve hatchery reform. This is by no means an extravagant request. WDFW is asking the Washington State Legislature to consider funding \$45 million over ten years in repairs, reconfigurations, closures and other changes to its hatchery facilities—in advance of the more targeted recommendations to come from the Scientific Group. Decisions about where to direct this \$5 million in FY 2001 funds will be made in the context of the Scientific

Group's framework.

**Agency In-Kind Contributions (>\$3.8 million in FY 2000/>\$2.1 million for FY2001)**

The co-manager agencies are providing significant in-kind contributions to the Hatchery Reform Project, leveraging the federal appropriation to achieve greater results. WDFW reports that during its 2000 legislative session, the Washington State Legislature appropriated \$300,000 for hatchery assessment, to be used with the federal funds to directly support the WDFW science team. Additional state funds were allocated for genetic mapping of salmon stocks (\$490,000), rebuilding endangered salmon runs with hatcheries (\$100,000) and for staff to comply with the permitting process and compliance with the Endangered Species Act (\$823,000). The state has also allocated \$1,800,000 for a new statewide marking and sampling program for hatchery chinook and coho.

The tribes of the NWIFC provide technical expertise for salmon recovery and hatchery reform. During FY 2000, significant tribal resources were applied to efforts such as the Hood Canal/ Strait of Juan de Fuca Summer Chum Recovery Plan, Comprehensive Coho and Comprehensive Puget Sound Chinook planning processes. Each of these plans includes elements for hatchery management planning, therefore contributing to success of the Hatchery Reform Project. NWIFC estimates the value of these resources at approximately \$250,000.

For FY 2001, WDFW has requested \$1.7 million as part of the next Washington state biennial capital budget to retrofit physical structures at hatcheries where these structures create obstacles to wild juvenile and adult salmon passage. WDFW made a presentation to the Legislature on this request in February and expects it to be acted upon during the next legislative session.

Tribal fishery management and hatchery programs are funded almost exclusively by federal appropriations. Tribes continually refocus their programs to address the most pressing salmon related issues. Significant portions of tribal programs and resources have been refocused to address salmon recovery issues such as ESA and hatchery reform. In FY 2001, the tribes of NWIFC will continue to provide much of the technical expertise regarding changes needed in hatchery programs. They will work to complete Comprehensive Coho and Comprehensive Puget Sound Chinook watershed plans, which includes hatchery management planning. They will also continue to contribute technical expertise in genetics and hatchery management and to utilize extremely limited hatchery maintenance funds provided through the Bureau of Indian Affairs. NWIFC estimates that these resources will be in the area of \$350,000.

Unlike the State of Washington, which can provide legislative appropriations to WDFW to implement hatchery reform, federal appropriations are the only avenue available to the tribes for hatchery management and reform. Hatchery reform is an ongoing process, and the tribes feel strongly that consistent federal funding is absolutely necessary to enable them to conduct hatchery-specific studies that provide information leading to progressive modifications of hatchery programs.

## IX. OUTREACH AND COMMUNICATIONS PLAN

As directed by Congress, Long Live the Kings (LLTK) has developed and is conducting an outreach and communications effort to support the Hatchery Reform Project, in addition to its facilitation work. The purpose of the outreach effort is to educate stakeholders, the public, the Legislature, and Congress about how the system of hatchery uses in Puget Sound and along the coast are being repositioned to help recover wild stocks and to provide for sustainable fisheries. In addition to this informational goal, the effort is also intended to provide these same stakeholders with an opportunity for input.

Providing comprehensive outreach for this project is important for a number of reasons. First, this effort to systematically and scientifically examine and reform hatchery practices is indeed historic when considered against the backdrop of hatchery history in Washington state. It is therefore important for stakeholders, the public and the media to be aware that it is occurring. Second, this same history has left a segment of the population deeply skeptical about the prospects for hatcheries to accomplish anything other than providing fish for harvest, especially to play a positive role in salmon recovery. Effective and credible outreach will be required to convince many people to give the project the “benefit of the doubt” through its implementation stage. Finally, hatcheries are quite often a much-appreciated local asset with their home communities. Those local-level stakeholders will need to be provided with solid information about the comprehensive nature of the project to get beyond an initial instinct to focus on protecting “their” hatchery and its production programs.

LLTK is conducting the Outreach and Communication plan for FY 2000 in three phases (see Appendix N, *Hatchery Reform Outreach and Communication Plan*). Phase I took place from February to June, 2000 and focused on setting the stage for the Hatchery Reform Project. It included establishing lines of communication, providing initial staff briefing, press releases and newsletter articles from co-manager leaders, the April Congressional Field Hearing and other aspects. Phase II will run from July to September, 2000 and focuses on providing the co-managers, state and federal legislators, state and tribal staff and other stakeholders with a fuller understanding of the project and its results to date. Phase III will run from October to December, with a focus on securing funding for hatchery reform in FY 2001.

*This report was prepared by Long Live the Kings and the Hatchery Scientific Review Group, as directed by the U.S. Congress in its FY 2000 appropriation creating the Puget Sound and Coastal Washington Hatchery Reform Project. For more information, contact Long Live the Kings at (206) 382-9555, [lltk@lltk.org](mailto:lltk@lltk.org) or visit the Hatchery Reform web site at [www.lltk.org/hatcheryreform.html](http://www.lltk.org/hatcheryreform.html).*

---

<sup>1</sup> Lichatowich, Jim **Salmon Without Rivers: A History of the Pacific Salmon Crisis**, Island Press, Washington, DC, p. 117.

<sup>2</sup> Washington State Department of Natural Resources **Our Changing Nature: Natural Resource Trends in Washington State**, 1998, Washington State Department of Natural Resources, p. 63.

<sup>3</sup> Source: Washington Department of Fish and Wildlife.

<sup>4</sup> Ibid.

<sup>5</sup> Washington Department of Fish and Wildlife **September 1997 Final Environmental Impact Statement**

**for the Wild Salmonid Policy**, Washington Department of Fish and Wildlife, 600 Capitol Way North, Olympia, WA 98501-1091.

<sup>6</sup> Source: Washington Department of Fish and Wildlife.

<sup>7</sup> Pacific Fishery Management Council **1994 Klamath River Fall Chinook Review Team Report, Technical Appendix**. Pacific Fishery Management Council, 21130 SW Fifth Avenue, Suite 224 Portland, Oregon.

<sup>8</sup> Washington Department of Fish and Wildlife **September 1997 Final Environmental Impact Statement for the Wild Salmonid Policy**, Washington Department of Fish and Wildlife, 600 Capitol Way North, Olympia, WA 98501-1091.

<sup>9</sup> Federal Judge William H. Orrick, *US v. Washington*, Phase II.

<sup>10</sup> Washington Department of Fish and Wildlife **September 1997 Final Environmental Impact Statement for the Wild Salmonid Policy**, Washington Department of Fish and Wildlife, 600 Capitol Way North, Olympia, WA 98501-1091.

<sup>11</sup> An ESU is defined as a population that 1) is substantially reproductively isolated from conspecific populations and 2) represents an important component of the evolutionary legacy of the species (source: WDFW Watershed Recovery Inventory Project, First Draft Report, Appendix A, 1997).

<sup>12</sup> Endangered Species Act Status of Washington Salmon, Trout and Steelhead Populations, as of November 22, 1999, [www.governor.wa.gov/esa/listings.htm](http://www.governor.wa.gov/esa/listings.htm).

<sup>13</sup> Committee on Protection and Management of Pacific Northwest Anadromous Salmonids **Upstream: Salmon and Society in the Pacific Northwest**, National Academy Press, Washington, DC, 1996, p. 12.

<sup>14</sup> For example, if a hatchery has a poor location in terms of hatchery/wild fish interactions or inadequate water supply, the Gorton Science Advisory Team would expect that a full scientific elaboration of the problem be developed and explained to all relevant interests (source: Gorton Science Advisory Team memo to the Hatchery Scientific Review Group, December 17, 1999).

<sup>15</sup> For example, the proposed use of hatcheries and artificial propagation to assist with recovery and restoration of naturally spawning populations assumes that hatchery fish are capable of reproducing under natural conditions and conferring a demographic and net biological benefit to an imperiled population. Such benefits are predicted from basic, quantitative models of population dynamics and theoretical population genetics. However, such benefits also assume that the genetic and environmental effects of juvenile hatchery rearing do not significantly affect the natural reproductive success of those fish when they return as adults. Similarly, the ability of hatchery propagation to maintain sustainable fisheries without negatively affecting naturally spawning populations directly (via biological interactions) or indirectly (via mixed fisheries) is largely unknown. On the contrary, existing data associated with past hatchery and fishery management practices suggest that hatchery-driven fisheries result, over time, in the replacement of wild fish with hatchery fish. Such hatchery-driven fisheries appear successful in the short run, because of the high harvest levels they can support. But they are not considered sustainable in the long run, because they substantially reduce the genetic and demographic viability of hatchery and natural populations, which are the biological foundations for future survival of a stock, ESU or species (source: Hatchery Scientific Review Group member Donald Campton, PhD, USFWS).

<sup>16</sup> Committee on Protection and Management of Pacific Northwest Anadromous Salmonids **Upstream: Salmon and Society in the Pacific Northwest**, National Academy Press, Washington, DC, 1996, p. 6.

<sup>17</sup> For example, some of the necessary genetic studies require ten-year time frames to reach definitive conclusions.